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1. Your reference

Jg-3031

2. Patent application number
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0322259.3

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Peter George Milton
304 Broadway
Gillingham
Kent
ME8 6DU
United Kingdom

Patents ADP number *(if you know it)*

If the applicant is a corporate body, give the country/state of its incorporation

07357700001

4. Title of the invention

APPARATUS FOR REFURBISHING USED CORES FOR ROLLS OF PRINTING PAPER

5. Name of your agent *(if you have one)*

Graham Jones & Company

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

77 Beaconsfield Road
Blackheath
London
SE3 7LG
United Kingdom

Patents ADP number *(if you know it)*

2097001 ✓

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.

NO

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Continuation sheets of this form	
Description	7
Claim(s)	
Abstract	
Drawing(s)	1 + 1 JMC

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Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature [signature] Date 23/09/03

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr. G.H. Jones 020 8858 4039

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APPARATUS FOR REFURBISHING USED CORES FOR ROLLS OF PRINTING PAPER

This invention relates to apparatus for refurbishing used cores for rolls of printing paper.

Cores for rolls of printing paper have traditionally been thrown away after the roll of paper on the core has been used up. Developments in technology have provided reel tracking systems for tracking the rolls of paper as they progress from paper mills to warehouses, docks, customer paper stores and printing machines. These tracking systems involve tagging the cores with identity tags. The identity tags are a significant cost item, and the paper industry is not satisfied at having to pay for the cost of the identity tags if they are thrown away with the used cores when the printing paper on the cores has been used up.

It is an aim of the present invention to reduce the above mentioned problem.

Accordingly, in one non-limiting embodiment of the present invention there is provided apparatus for refurbishing used cores for rolls of printing paper, which apparatus comprises:

stripper means for stripping remaining printing paper from the used cores;

feed means for feeding the used cores to the stripper means;

cleaning means for cleaning the used cores after they have been treated by the stripper means; and

adhesive applicator means for applying adhesive to the used cores whereby the used cores are then ready for re-use as refurbished cores for new rolls of paper.

The cores are preferably made of a plastics material. The cores may be made of other suitable and appropriate materials, including treatable cardboard.

The apparatus may include sensor means for measuring and recording the length of the printing paper stripped from each used core. The sensor means preferably measures in metric units so that the sensor means may measure in meters and/or millimeters. If desired however the sensor means may measure in imperial units so that the sensor may then measure in feet and inches.

The apparatus may include a waste bin for receiving the printing paper stripped from each used core.

The apparatus advantageously includes tag reader means for reading identity tags, there being one identity tag on each used core. The apparatus may then be one in which the identity tags are radio frequency identity tags, and in which the tag reader means is adapted to read the radio frequency identity tags. The tag reader means thus enables the identification of each used core. Remaining printing paper that was on each used core can then be identified, along with other information on the progress of each core during the life of its roll of paper, for example from a paper mill to a

warehouse, docks, a customer paper store and eventually to a printing machine.

The stripper means may comprise rollers for rotating the cores, end-obtaining means for obtaining a free end of the remaining printing paper on each used core, and pull means for pulling the remaining printing paper off each used core. Other types of stripper means may be employed if desired.

The rollers for rotating the cores are preferably a pair of reversible drive rollers. The end-obtaining means is preferably a roller. The end-obtaining means in the form of the roller may rotate in an opposite direction to a direction of rotation of each one of the used cores by the rollers for rotating the cores. The end-obtaining means in the form of the roller is preferably a brush roller. Rollers having other types of surfaces for picking up the free-end of the remaining printing paper on each used core may be employed.

The feed means is preferably a conveyor feed means. Other types of feed means may be employed so that, for example, the feed means may be a hopper feed means.

The cleaning means is preferably a roller cleaning means. Other types of cleaning means may however be employed.

Preferably, the roller cleaning means has at least one scrubbing roller, and a wash station. Preferably, the apparatus is one in which there are more than one of the scrubbing rollers, and in which the wash station is a hot wash station. The wash station preferably includes a container for containing cleaning water.

The adhesive applicator means preferably comprises at least one roller for applying the adhesive. Preferably there are two of the rollers for applying the adhesive. The adhesive applicator means may also include a container for containing the adhesive. Other types of adhesive applicator means that do not use rollers may be employed if desired so that, for example, the adhesive applicator means may be a spray adhesive applicator means.

An embodiment of the invention will now be described solely by way of example and with reference to the accompanying drawing which shows apparatus for refurbishing used cores for rolls of printing paper.

Referring to the drawing, there is shown apparatus 2 for refurbishing used cores 4 for rolls of printing paper. The apparatus 2 comprises stripper means 6 for stripping remaining printing paper 8 from the used cores 4. The apparatus 2 further comprises feed means 10 for feeding the used cores 4 to the stripper means 6. Cleaning means 12 is provided for cleaning the used cores 4 after they have been treated by the stripper means 6. Adhesive applicator means 14 is provided for applying adhesive 16 to the used cores 4, whereby the used cores 4 are then ready for re-use as refurbished cores for new rolls of paper.

The apparatus 2 includes sensor means 18 for measuring and recording the length of the printing paper 8 stripped from each used core 4. The sensor means 18 measures the length of the printing paper 8 in meters.

The apparatus 2 also includes a waste bin 20 for receiving the printing paper 8 stripped from each used core 4. The printing paper 8 in the

waste bin 20 is then available for re-use or disposal as may be suitable and appropriate.

The apparatus 2 further includes tag reader means 22 for reading identity tags (not shown). There will be one identity tag on each used core 4. The identity tags are radio frequency identity tags. The tag reader means 22 is adapted to read the radio frequency identity tags. Thus each used core 4 can be individually identified. Particulars applicable to that core such for example as the amount of printing paper 8 remaining on the core, and the passage of the entire roll of printing paper supported on the used core from a paper mill to a printing press can be logged.

The stripper means 6 comprises two rollers 24 for rotating the used cores 4. The two rollers 24 are reversible drive rollers 24. The stripper means further comprises end-obtaining means in the form of a roller 26. The roller 26 obtains a free-end of the remaining printing paper on each used core 4. The roller 26 is a brush roller.

The stripper means 6 further comprises pull means 28 for pulling the remaining printing paper 8 off each used core 4. The pull means 28 comprises two pairs of rollers 30, 32 as shown. A transfer arm 34 helps to transfer the free end of the printing paper 8 from the used core 4 being treated by the rollers 24 to the rollers 30.

The feed means 10 is a conveyor feed means 10 as shown. The conveyor feed means 10 comprises a conveyor 36 and dividers 38 for forming compartments 40. There is one compartment 40 for each used core 4 as shown.

The cleaning means 12 is a roller cleaning means 12. The roller cleaning means 12 has scrubbing rollers 42 and a hot wash station 44. Two support rollers 46 support the used cores 4 one at a time as they pass through the cleaning means 12. The support rollers 46 are then able to move the cleaned used cores 4 to the adhesive applicator means 14. Hot water 48 from the hot wash station 44 is collected in a container in the form of a tray 50.

The adhesive applicator means 14 comprises a pair of rollers 52 for applying the adhesive 16 to the cores 4. The cores 4 then become refurbished cores ready for receiving new rolls of paper.

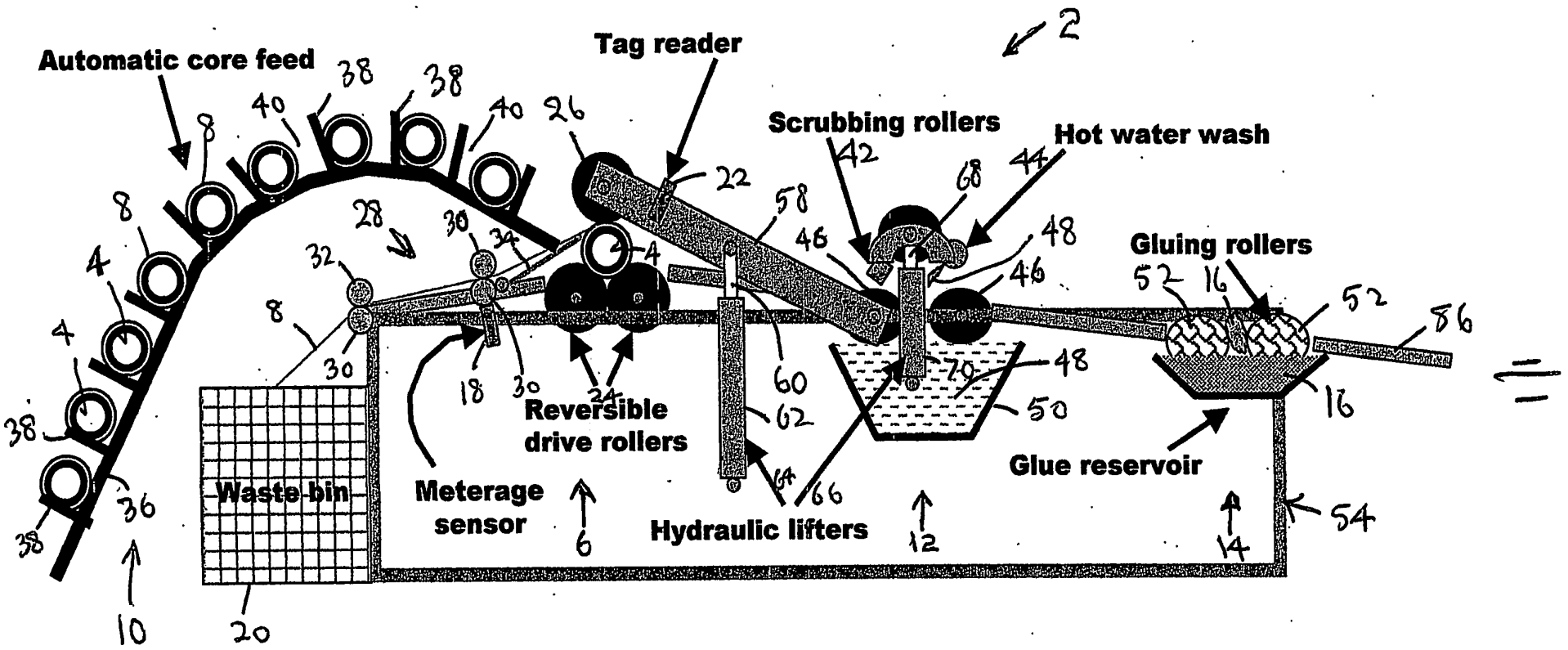
The apparatus 2 may be such that the various parts are mounted on a frame 54. Refurbished cores may leave the apparatus 2 via a sloping outlet 56. The rollers 26, 46 may be supported as shown on a pivoting arm 58 mounted on a piston 60. The piston 6 operates in a cylinder 62 of a hydraulic lifter 64. A similar but smaller hydraulic lifter 66 having a piston 68 operating in a cylinder 70 supports the scrubbing rollers 42 and the hot wash station 48.

The used cores 4 used in the apparatus of the present invention are made of a material suitable for being refurbished by the apparatus. Preferably the used cores are made of a plastics material. Advantageously, the used cores are constructed as described in my UK Patent Application No. 0303461.8. Thus the used cores may comprise a body portion, a bore through the body portion, a first end member which is removably secured to a first end of the body portion, and a second end member which is

removably secured to a second end of the body portion, the core being made of a plastics material. With such cores, the cores can each be provided with an identity tag such as a radio frequency identity tag. The identity tags are able to be recycled with the cores, and thus wastage of cores in throwing them away is avoided. If handling of a roll of paper should cause the first end member and the second end member to become damaged, then the damaged member can easily be replaced while still retaining the remainder of the core. The core, as described in my United Kingdom Patent Application No. 0303461.8, may be one in which the first end member is inserted into the bore at the first end of the body portion, and in which the second end member is inserted into the bore at the second end of the body portion. The core may be one in which the first end of the body portion receives an insert portion on the first end member, and in which the second end of the body portion receives an insert portion on the second end member. Preferably, the first end member is a push-in friction fit in the first end of the body portion, and the second end member is a push-in friction fit in the second end of the body portion.

It is to be appreciated that the embodiment of the invention described above with reference to the accompanying drawing has been given by way of example only and that modifications may be effected. Thus, for example, different types of stripper means 6, cleaning means 12 and adhesive applicator means 14 to those shown in the drawing may be employed.

OBU-EMS PAPER CORE REFURBISHMENT MACHINE



Remaining paper stripped from reusable cores.
The meters of paper on each one is measured and recorded including the tag identity.
A full wastage report will be sent to the printer and paper purchaser.
Cores are then cleaned and re-quick-started.